WHAT IS CLAIMED IS:

1. A method to bind nucleic acids to magnetizable cellulose comprising:

a) combining magnetizable cellulose with a solution containing nucleic acids, thereby producing a combination, and

b) adjusting the salt and polyalkylene glycol concentrations of the combination to concentrations suitable for binding the nucleic acids to the magnetizable cellulose, whereby all or a portion of the nucleic acids in the solution binds to the magnetizable cellulose.

2. The method of claim **1**, wherein the nucleic acids are DNA and the polyalkylene glycol is polyethylene glycol.

3. The method of claim **2**, wherein the polyethylene glycol has a molecular weight of 8000, and wherein the salt is sodium chloride.

4. The method of claim **3**, wherein the concentration of polyethylene glycol is adjusted to about 10% and wherein the concentration of sodium chloride is adjusted to between 0.25 M and 5.0 M.

5. The method of claim **1**, wherein the nucleic acids are RNA and the polyalkylene glycol is polyethylene glycol.

6. The method of claim **1**, wherein the magnetizable cellulose is in the form of particles and optionally contains up to 90% by weight magnetic iron oxide.

7. A method of separating nucleic acids from non-nucleic acid materials in a nucleic acid solution, comprising:

a) combining magnetizable cellulose with a solution containing nucleic acids and non-nucleic acid materials to produce a first combination;

b) adjusting the salt and polyethylene glycol concentrations of the first combination to concentrations suitable for binding nucleic acids in the solution to the magnetizable cellulose, producing a second combination comprising magnetizable cellulose-bound nucleic acids;

c) separating the magnetizable cellulose-bound nucleic acids from the second combination;

d) contacting the magentizable cellulose-bound nucleic acids separated in c) with an elution buffer to release the bound nucleic acids from the magnetizable cellulose and into the elution buffer; and

e) separating the magnetizable cellulose from the elution buffer to provide nucleic acids that are substantially free of the non-nucleic acid materials.

8. The method of claim **7**, wherein the separation of the magnetizable cellulose particles in step c)and e) is carried out magnetically.

9. The method of claim **8**, wherein the nucleic acids bound to magnetizable cellulose particles are DNA and are washed with a wash buffer, wherein the wash buffer removes impurities bound to the magnetizable cellulose particles while leaving the DNA bound to the magnetizable cellulose particles.

10. The method of claim **9**, wherein the DNA bound to the magnetizable cellulose particles is eluted with an elution buffer that releases the DNA bound to the magnetizable particles.

11. The method of claim **10**, wherein the DNA released by the elution buffer is isolated.

12. The method of claim **7**, wherein the polyethylene glycol has a molecular weight of 8000, and wherein the salt is sodium chloride.

13. The method of claim **12**, wherein the concentration of polyethylene glycol is about 10%, and concentration of sodium chloride is between 0.25 M to 5.0 M.

14. The method of claim **7**, wherein the nucleic acids and non-nucleic acid materials are obtained from a cell lysate.

15. The method of claim **14**, wherein the lysate is prepared from cells of human, animal, plant, viral or bacterial origin.

16. A kit for isolation and purification of nucleic acids, comprising magnetizable cellulose and reagents at suitable concentrations for isolating nucleic acids from various sources.

17. A method to bind nucleic acids to magnetizable cellulose derivatives, comprising:

a) combining magnetizable cellulose derivatives with a solution containing nucleic acids, thereby producing a combination, and

b) adjusting the salt and polyalkylene glycol concentrations of the combination to concentrations suitable for binding the nucleic acids to the magnetizable cellulose derivatives, whereby all or a portion of the nucleic acids in the solution bind to the magnetizable cellulose derivatives.

18. The method of claim **17**, wherein the cellulose derivatives are selected from the group consisting of cellulose-CM, cellulose-DEAE and combinations thereof.

19. The method of claim **17**, wherein the nucleic acids are DNA and the polyakylene glycol is polyethylene glycol.

20. The method of claim **17**, wherein the nucleic acids are RNA and the polyakylene glycol is polyethylene glycol.

21. The method of claim **19**, wherein the polyethylene glycol has an average molecular weight of about 8000, and wherein the salt is sodium chloride.

22. The method of claim **21**, wherein the concentration of the polyethylene glycol is adjusted to about 10% and wherein the concentration of sodium chloride is adjusted to between 0.25 M and 5.0 M.

23. The method of claim **17**, wherein the magnetizable cellulose derivatives are in the form of particles and optionally comprise magnetic iron oxide in an amount of up to 90% by weight.

24. A method of separating nucleic acids from non-nucleic acid materials, comprising:

a) combining magnetizable cellulose derivatives with a solution containing nucleic acids and non-nucleic acid materials to provide a first combination;

b) adjusting the salt and polyethylene glycol concentrations of the first combination to concentrations suitable for binding nucleic acids to the magnetizable cellulose

derivatives, producing a second combination comprising magnetizable cellulose derivative-bound nucleic acids;

c) separating the magnetizable cellulose derivative-bound nucleic acids from the second combination;

d) contacting the magnetizable cellulose derivative-bound nucleic acids separated in c) with an elution buffer to release the bound nucleic acids from the magnetizable cellulose derivatives and into the elution buffer; and

e) separating the magnetizable cellulose derivatives from the elution buffer to provide nucleic acids that are substantially free of the non-nucleic acid materials.

25. The method of claim **24**, wherein the separation of the magnetizable cellulose derivatives in step c)and e) is carried out magnetically.

26. The method of claim **24**, wherein the nucleic acids bound to magnetizable cellulose derivatives are washed with a wash buffer, wherein the wash buffer removes impurities bound to the magnetizable cellulose derivatives while leaving the nucleic acids bound to the magnetizable cellulose derivatives.

27. The method of claim **26**, wherein the nucleic acids bound to the magnetizable cellulose derivatives are DNA and are eluted with an elution buffer, wherein the elution buffer releases the DNA bound to the magnetizable cellulose derivatives.

28. The method of claim **27**, wherein the DNA released by the elution buffer is isolated.

29. The method of claim **24**, wherein the polyethylene glycol has an average molecular weight of about 8000, and wherein the salt is sodium chloride.

30. The method of claim **29**, wherein the concentration of polyethylene glycol is about 10%, and the salt concentration is between 0.25 M to 5.0 M.

31. The method of claim **24**, wherein the nucleic acids and non-nucleic acid materials are obtained from a cell lysate.

32. The method of claim **31**, wherein the lysate is prepared from cells of human, animal, plant, viral or bacterial origin.

33. A kit for isolation and purification of nucleic acids, comprising magnetizable cellulose derivatives and reagents at suitable concentrations for isolating nucleic acids from various sources.